

# Service Manual

**Disassembly/Assembly**

**Procedures**

**Mechanical Adjustment**

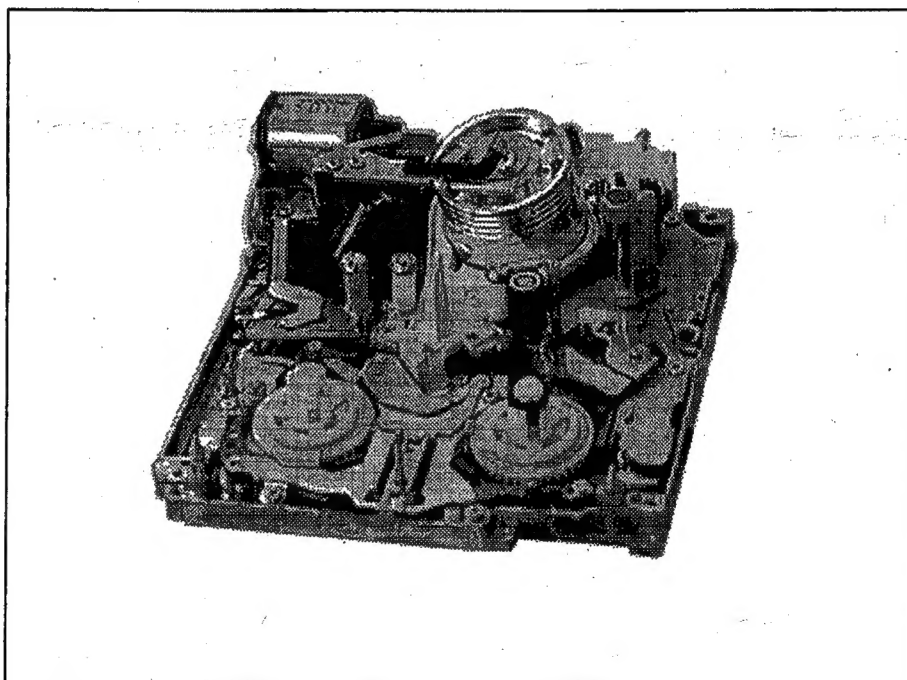
**Procedures**

**Exploded Views/Parts List**

**Panasonic** Mini DV PAL

Digital Video Camera

## DJ MECHANISM CHASSIS



### INTRODUCTION

The DJ-Mechanism chassis are built in several Panasonic Digital Video Camera from NV-DX1 series in 1996.

#### ⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

**Panasonic**

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## 1. Mechanical Parts Location

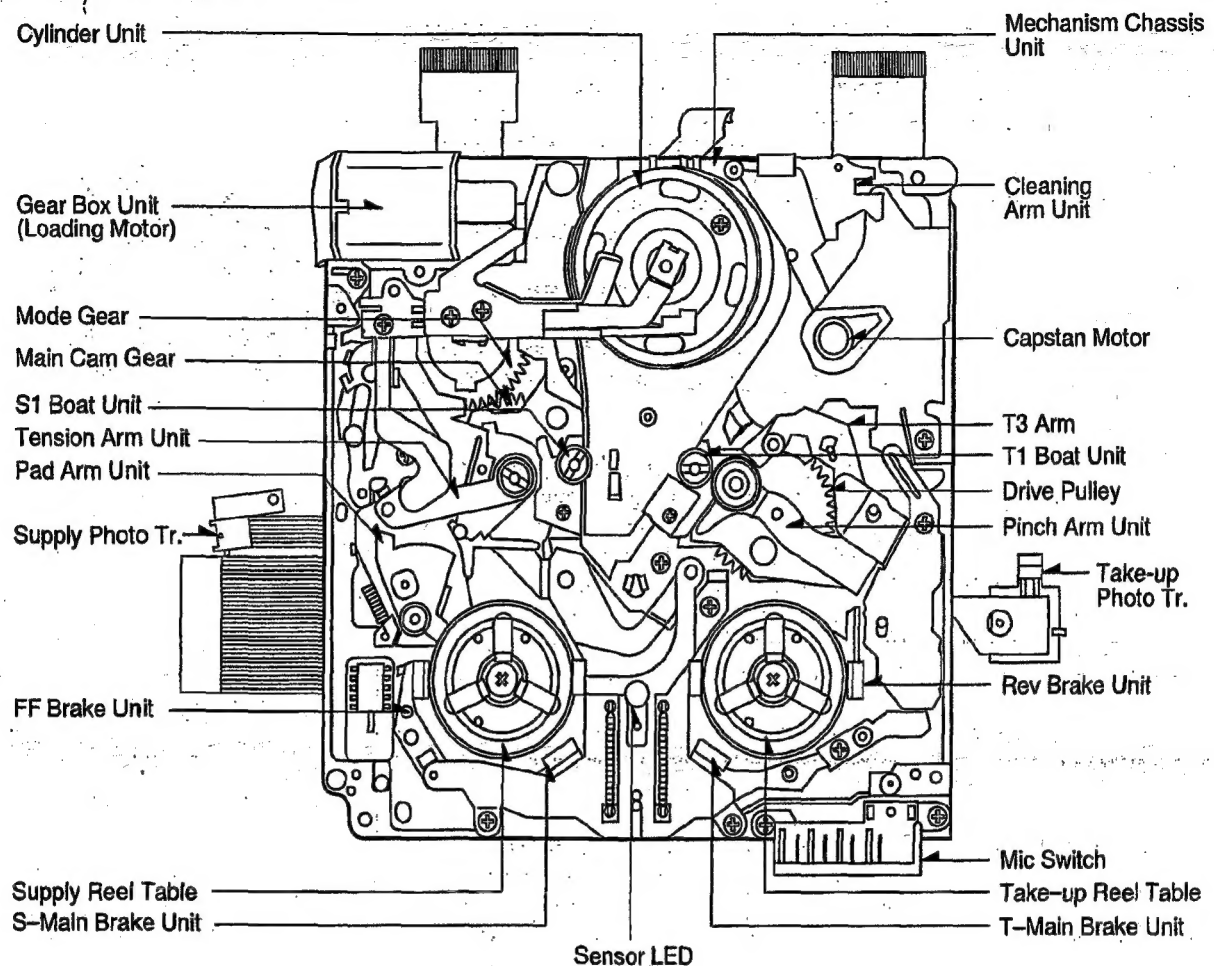


Fig. 1

## 2. Disassembly/Assembly Procedures of Mechanism

This procedure starts with the condition that the mechanism unit has been removed from the unit.

The following chart indicates disassembly steps of the mechanical parts in order to gain access to part for servicing. When reassembling, perform the steps in the reverse order. Then apply the Molyton Grease to the lubrication point.

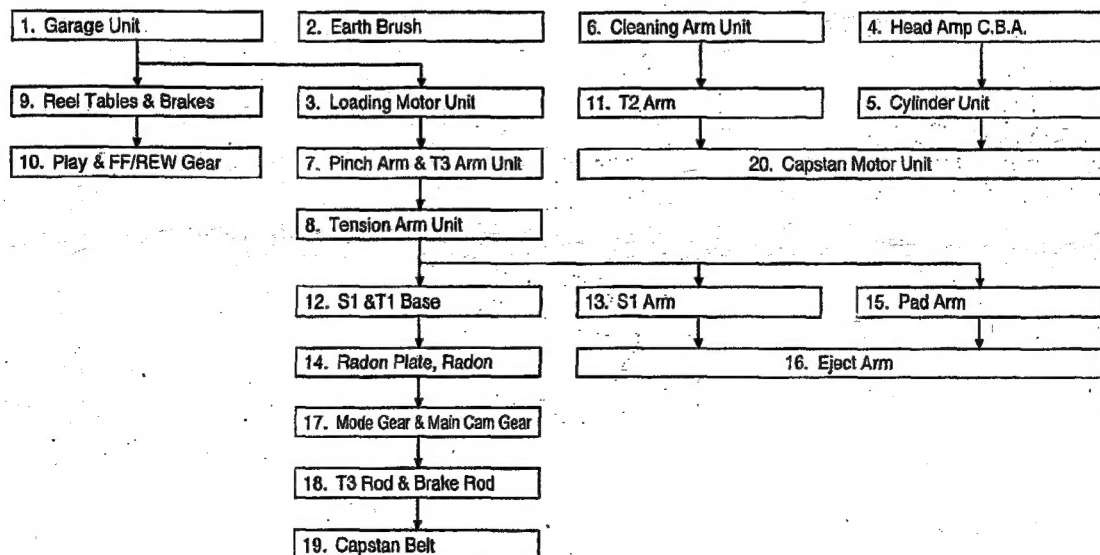


Fig. 2

- |                                   |          |  |
|-----------------------------------|----------|--|
| 1. Garage Unit                    | Fig. M1  | Slide the Lock Lever using tweezers to eject the Garage Unit.  |
| (Manual Eject)                    | Fig. M2  | Unscrew 2 screws (A) and remove Supply and Take-up Photo Transistors from Garage Unit.<br>Unscrew 4 screws (B) and remove the Garage Unit.   |
| 2. Earth Brush                    | Fig. M3  | Unscrew 2 screws (C) and remove the Earth Brush.   |
| (Note of installation)            | Fig. M4  | When installing the Earth Brush, align the Earth Brush tip position.   |
| 3. Loading Motor Unit             | Fig. M5  | Unsolder the soldered portion (D).<br>Unscrew 2 screws (E) and remove the Loading Motor Unit.  |
| 4. Head Amp C.B.A.                | Fig. M6  | Unscrew screw (F) and remove the Capstan Cover.<br>Disconnect FP5001.<br>Unscrew 2 screws (G) and remove the Head Amp C.B.A.   |
| 5. Cylinder Unit                  | Fig. M7  | Unscrew 3 screws (H) and remove the Cylinder Unit carefully.<br>Do not touch the Video Head.   |
| 6. Cleaning Arm Unit              | Fig. M8  | Unlock the locking portion of the Cleaning Arm Unit.   |
| (Note of installation)            | Fig. M9  | Hooking portion of the Cleaning Arm Spring is;<br>Spring (a) — Cleaning Arm Spring (a')<br>Spring (b) — T2 Arm Unit (b')   |
| 7. Pinch Arm & unlock T3 Arm Unit | Fig. M10 | Unscrew screw (I), then slide the Pinch Pressure Plate and unlock the locking portion.   |
| (Note of installation)            | Fig. M11 | Remove the T3 Arm Unit.<br>After installed T3 Arm Unit, the Height Adjustment is required.   |
| (Note of installation)            | Fig. M12 | Remove the Pinch Arm Unit and Pinch Arm Spring.<br>Hooking portion of the Pinch Arm Spring is;<br>Spring (c) — Pinch Arm (c')<br>Spring (d) — T3 Rod (d')  |
| 8. Tension Arm Unit               | Fig. M13 | Turn the Mode Gear to counter-clockwise until Tension Arm Unit slightly move to loading direction.<br>Remove the Tension Arm Unit and Cut Washer (J).<br>The projection (e) on Tension Arm meets guide (e') on the T3 Rod which is shifted by turning Mode Gear. |
| (Note of installation)            | Fig. M14 | Unhook the hooking portion (f) and (f').   |
| 9. Reel Tables & Brakes           | Fig. M15 | Unscrew 3 screws (K) and remove Cover Plate.<br>Remove Supply and Take-up Reel Tables.   |

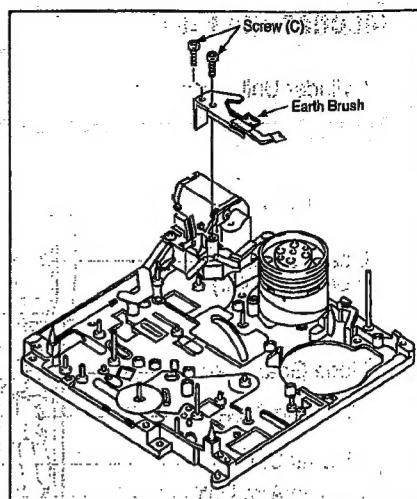


Fig. M3

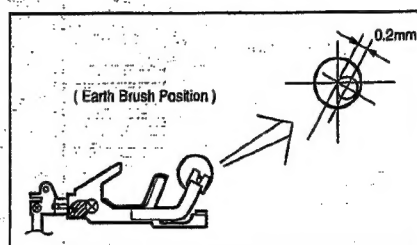


Fig. M4

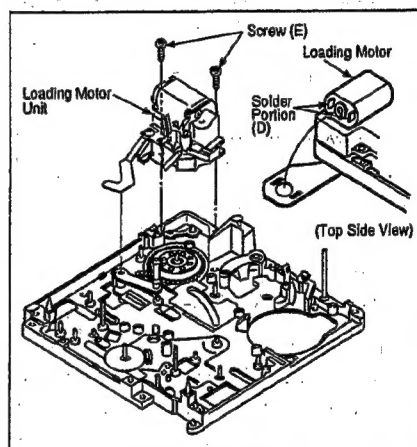


Fig. M5

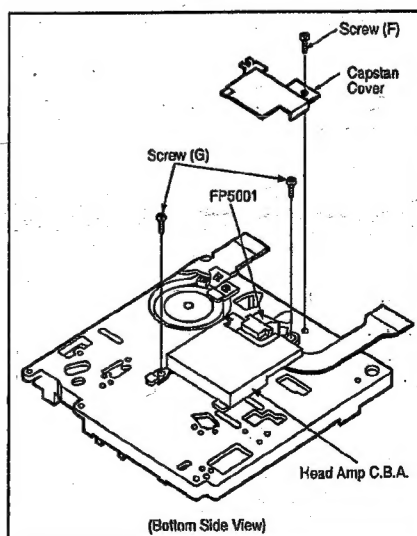


Fig. M6

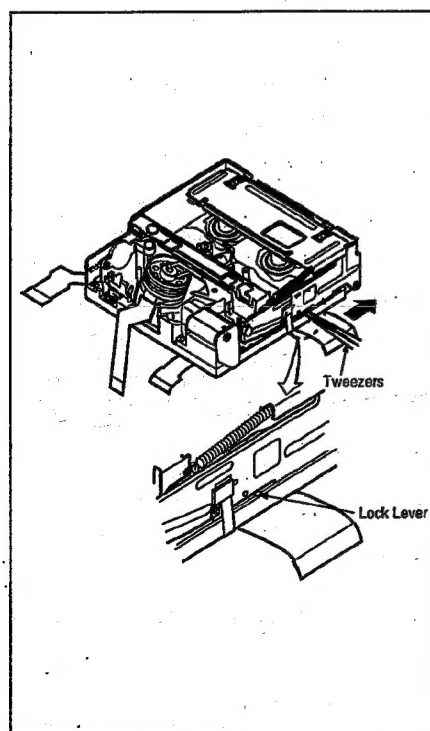


Fig. M1

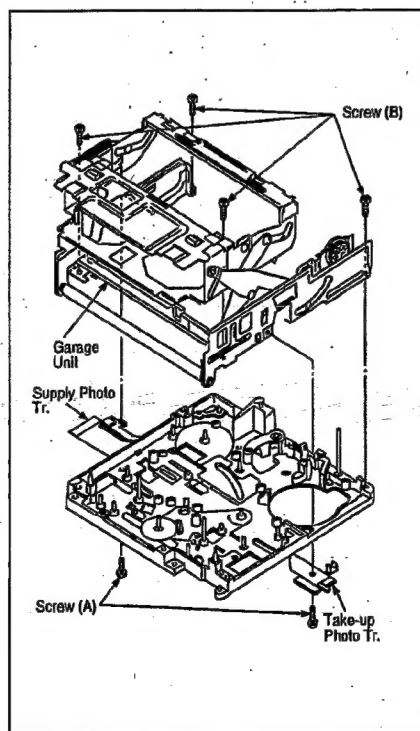


Fig. M2

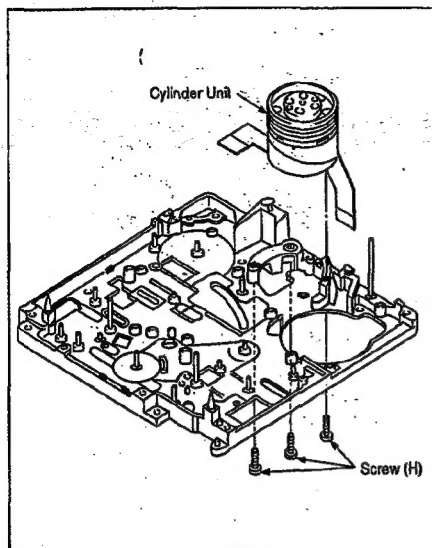


Fig. M7

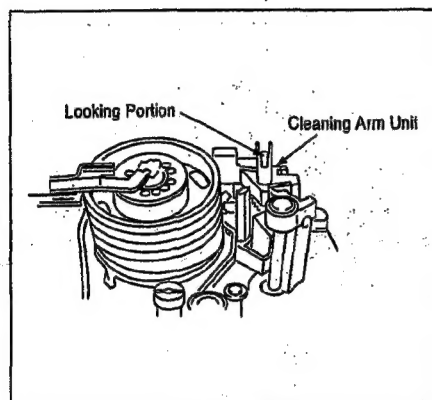


Fig. M8

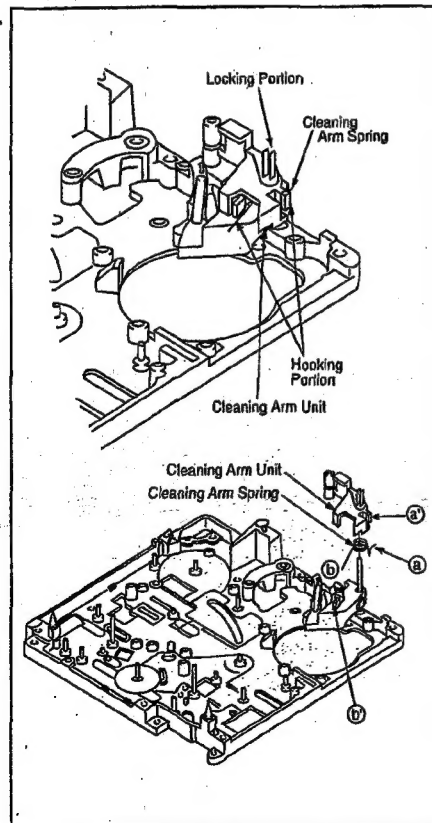


Fig. M9

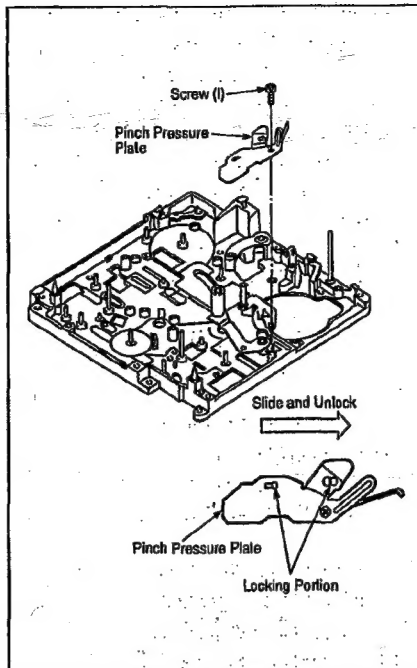


Fig. M10

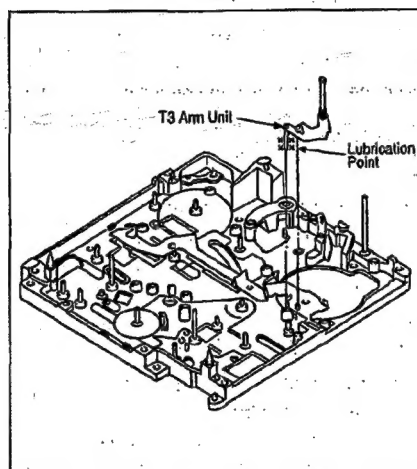


Fig. M11

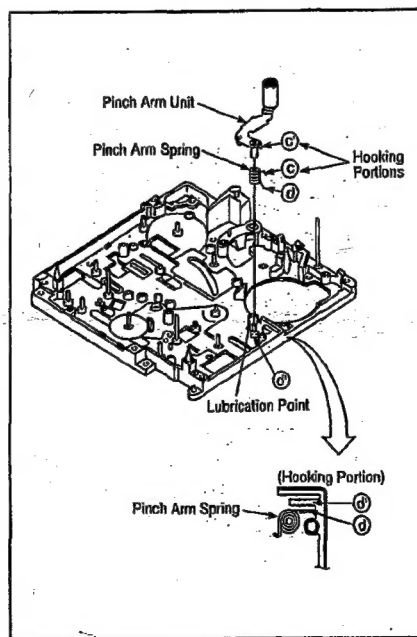


Fig. M12

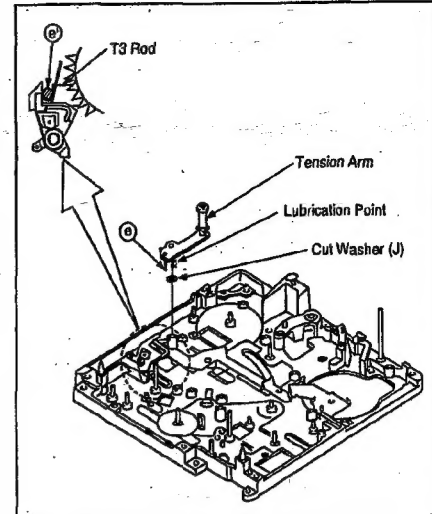


Fig. M13

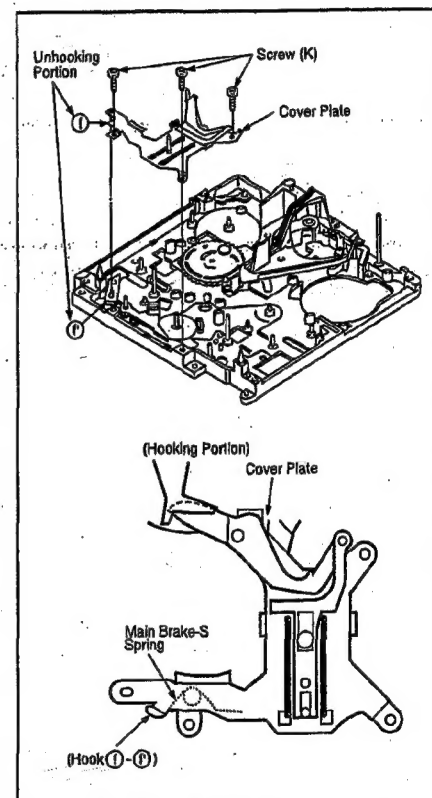


Fig. M14

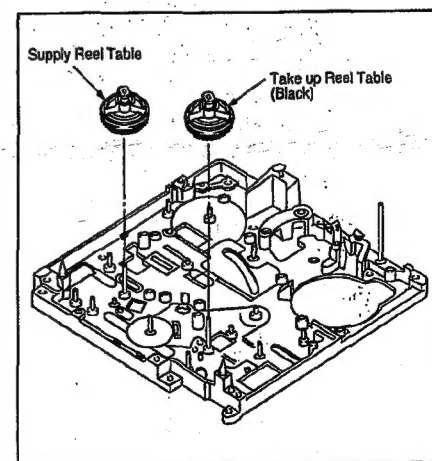


Fig. M15



- Fig. M16 Unhook the hooking portion (g) and (g') of the Review Brake Spring and remove Review Brake.
- Fig. M17 Remove the FF Brake and FF Brake Spring.
- (Note of installation)
- Fig. M18 Confirm the hooking portion of the FF Brake Spring.
- (Note of installation)
- Fig. M19 Remove the Main Brake S and Main Brake-S Spring.
- (Note of installation)
- Fig. M20 Confirm the hooking portion of the Main Brake-S Spring.
10. Play & FF/REW Gear Fig. M20 Remove the Play Idler and Play Gear.
11. T2 Arm Unit Fig. M21 Remove the Cut Washer (M) and T2 Arm Unit with Spring.
- (Note of installation)
- Fig. M22 Confirm the hooking portion of the T2 Arm Spring.
12. S1 & T1 Base Fig. M22 Turn the Mode Gear to counter-clockwise until half loading position.
- (Note of installation)
- Fig. M23 Hold (N) and (O) positions on S1 and T1 Arm units and unlock the locking portions (A) and (B) with tweezers.
- Remove 2 screws (P) and Cylinder Base Unit with S and T Boat Units. Then remove S and T Boat Units from the Cylinder Base Unit.
- After install the Cylinder Base Unit, S and T Boat move to completed loading position by finger and turn the Mode Gear to clockwise until half loading position.
- Then connect the locking portion (A) and (B).
13. S1 Arm Fig. M24 Turn the Mode Gear to fully counter-clockwise.
14. Radon Plate, Radon Arm & T1 Arm Fig. M25 Remove the Cut Washer (Q) and S1 Arm Unit.
- (Note of installation)
- Fig. M26 Unscrew 2 screws (R) and remove Radon Plate.
- Unscrew screw (S) and remove Radon Arm Unit.
- When installing the T1 Arm Unit, the projection (j) on the Radon Arm Unit is aligned to guide (j') on the T1 Arm Unit by pushing the T1 Arm Unit.
- Fig. M27 Remove the T1 Arm Unit.
15. Pad Arm Fig. M28 Unhook the hooking portion (k') of the Pad Arm Spring.
- (Note of installation)
- Fig. M29 Remove the Cut Washer (T) and Pad Arm Unit.
16. Eject Arm Fig. M29 Confirm the hooking portion of the Pad Arm Spring (k — k').
17. Mode Gear & Main Cam Gear Fig. M30 Unscrew 2 screws (U) and remove the Eject Arm Unit.
- (Note of installation)
- Fig. M30 Remove the Main Cam Gear.
- Unsolder the soldered portion (l) on the Mechanism Flexible Board. Then remove the Mode Gear.
- The projection (m) on the Mode Gear meets the hole (m') on the Mechanism Chassis.
- Push the Brake and T3 Rod in fully left direction.

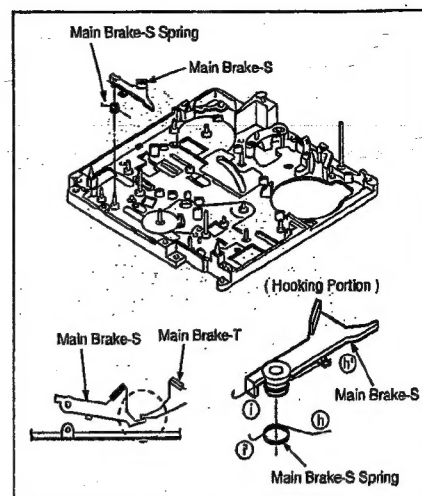


Fig. M18

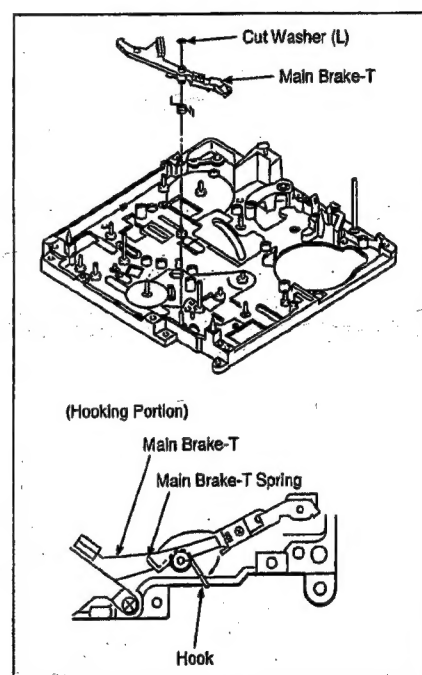


Fig. M19

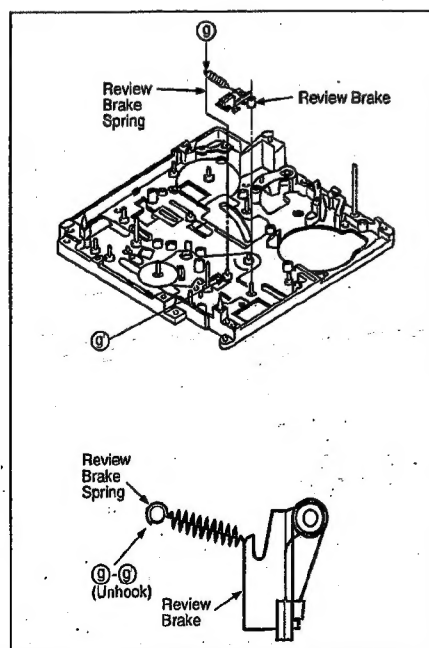


Fig. M16

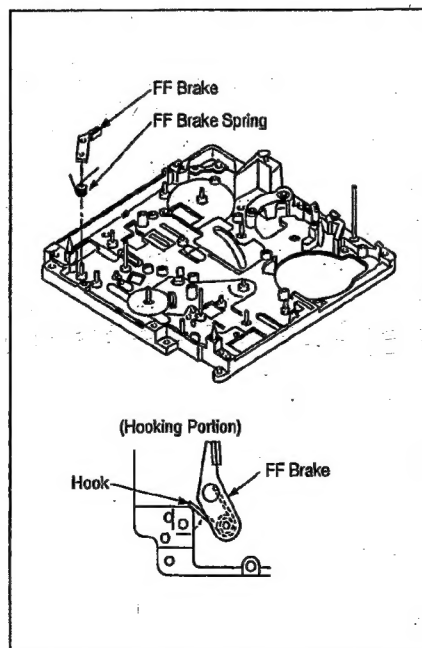


Fig. M17

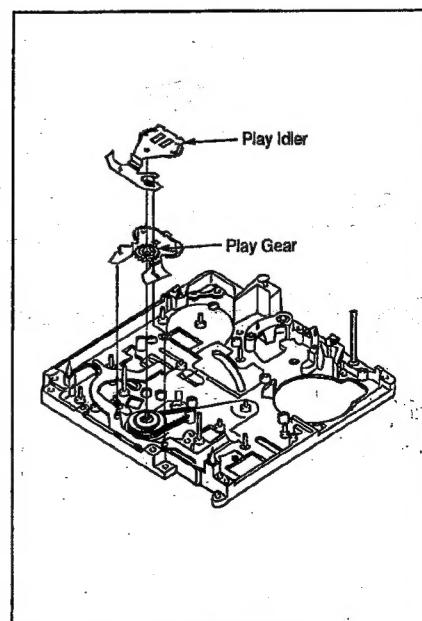


Fig. M20

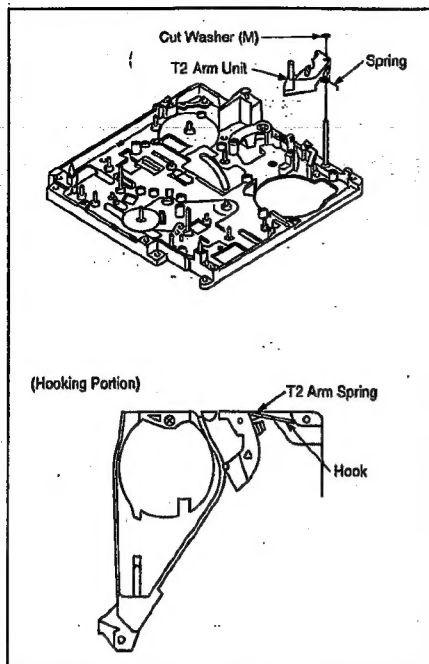


Fig. M21

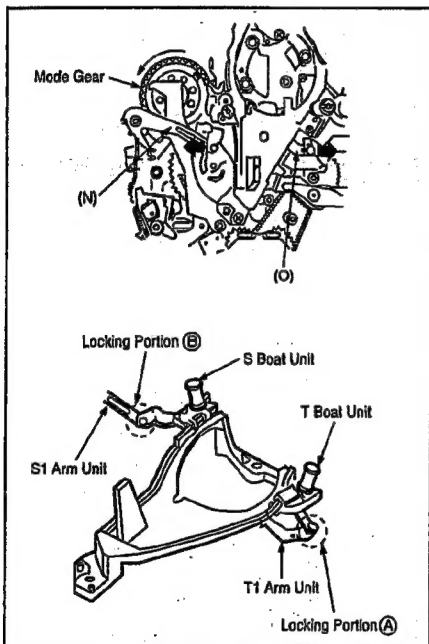


Fig. M22

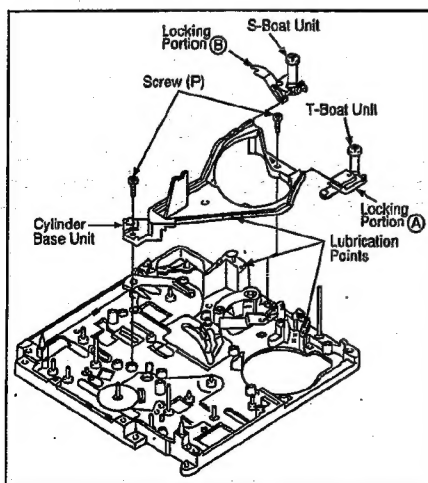


Fig. M23

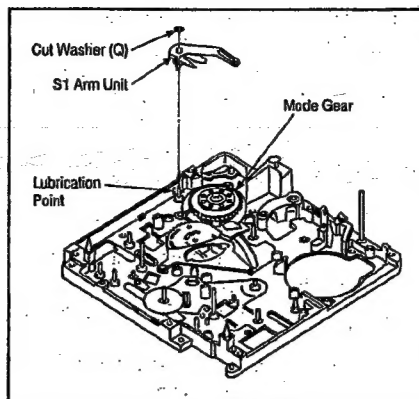


Fig. M24

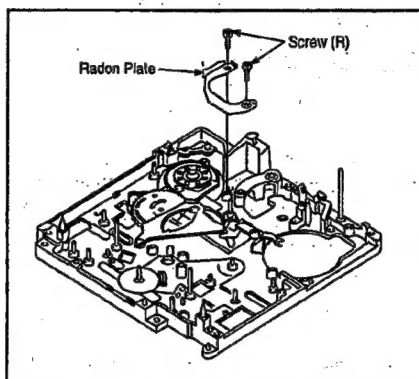


Fig. M25

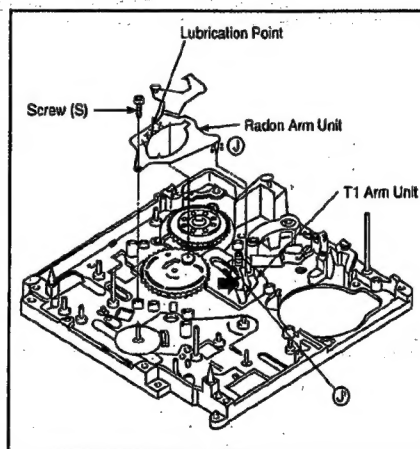


Fig. M26

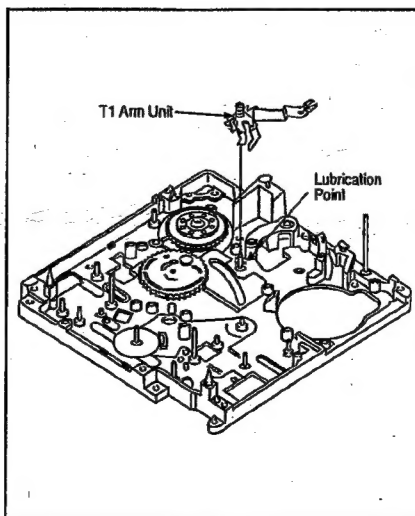


Fig. M27

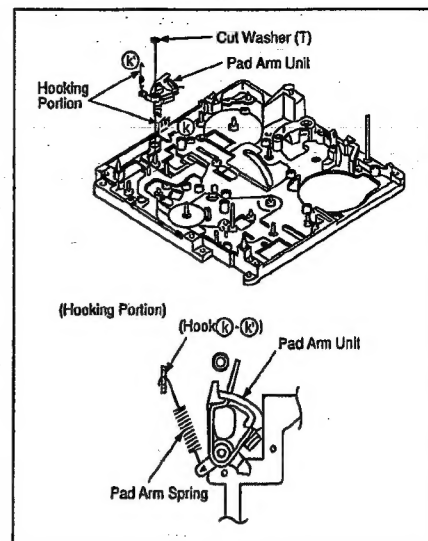


Fig. M28

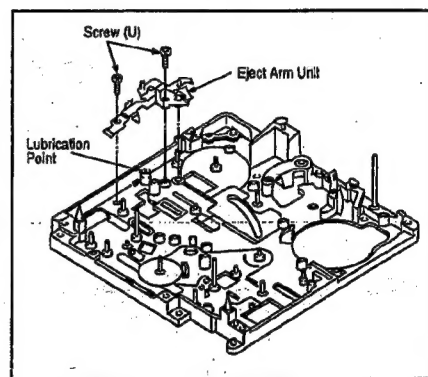


Fig. M29

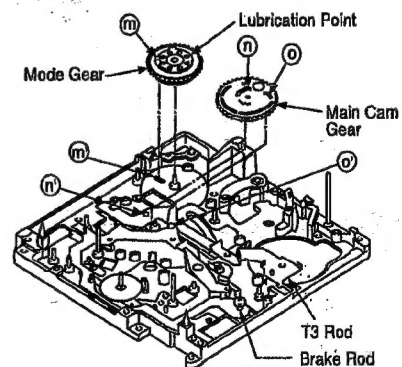
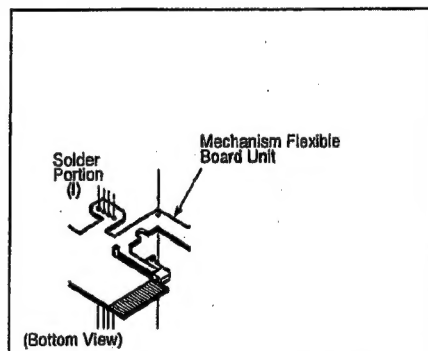


Fig. M30

- (Note of installation) Fig. M31 Install the Main Cam Gear so that the hole A on the Mode Gear is aligned to the hole B on the Main Cam Gear.
- Fig. M30 Shift the T3 Rod slowly in the right direction until guide (n) on the Main Cam Gear meets the projection (n') on the T3 Rod.
- Shift the Brake Rod slowly in the right direction until guide (o) on the Main Cam Gear meets the projection (o') on the Brake Rod.
18. T3 Rod & Brake Rod (Note of installation) Fig. M32 Remove the T3 Rod.
- The projection (p) and (q) on the T3 Rod meet the guide (p') and (q') on the Mechanism Chassis.
- Fig. M33 Unscrew 2 screws (V) and remove the Brake Rod, Brake Rod Plate A and B.
- (Note of installation) The projection (r) and (s) on the Brake Rod meet the guide (r') and (s') on the Mechanism Chassis.
19. Capstan Belt Fig. M34 Remove the Center Gear and Washer (W).
- Unscrew screw (X) and remove LED Holder.
- Remove Cut Washer (Y).
- Fig. M35 (Loosen a black screw on the Cap. Motor as shown in Fig. M36.) Slightly lift up in the direction and slowly remove the Capstan Gear. Do not bend the Capstan Shaft.
- (Note of installation) After installed Capstan Gear, confirm no warp of the Capstan Gear, no bend of the Capstan Gear Shaft and rotation of the Capstan and Center Gear smoothly.
- Remove the Capstan Belt.
20. Capstan Motor Unit (Note of installation) Fig. M34 Unscrew 3 screws (Z) and remove Capstan Motor.
- After installed Capstan Motor, Cap. Tilt Adjustment is required.

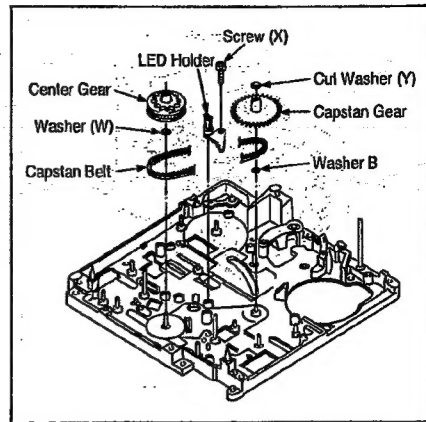


Fig. M34

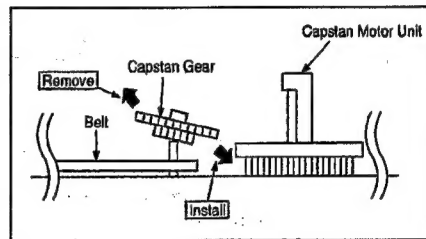


Fig. M35

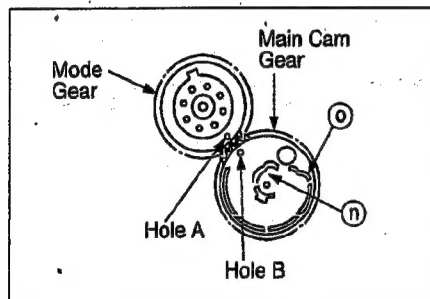


Fig. M31

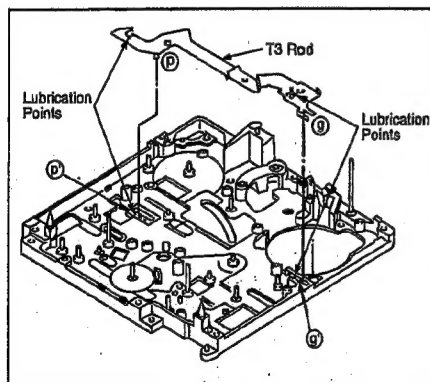


Fig. M32

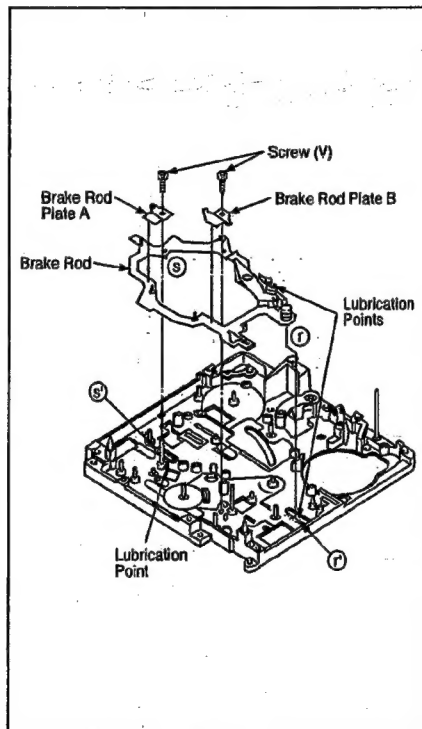


Fig. M33

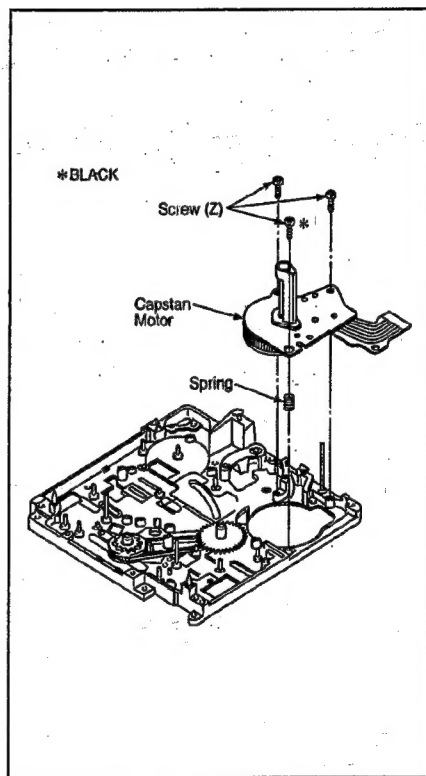


Fig. M36



### 3. Mechanical Adjustment Procedure

#### 3-1. Test Equipment and Tools

The following equipment is required for Mechanical adjustment.

1. \_\_\_\_\_ Tatsujin Kit for adjustment with PC  
 VFKW1000AA PC-EVR I/F Unit  
 VFKW1000C PC-EVR 232C Cable  
 VFKW0F0142 PC-EVR I/F Board  
 VFKW0F0001 Common Cable (2 pcs)  
 VFKW0T0006 Sub I/F Board for Video  
 VFKW0T0008 Video Attachment Cable  
 \_\_\_\_\_ PC-EVR Software for NV-DX1  
 \_\_\_\_\_ Personal Computer

2. VFK1234 BER Counter

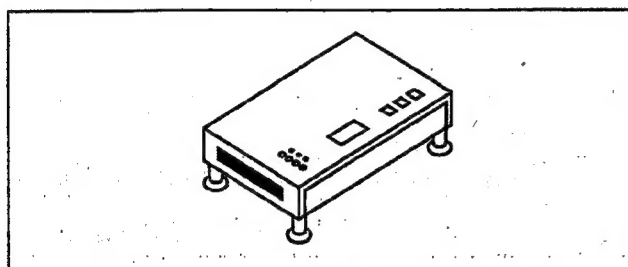


Fig. A1 For monitoring the Bit Error Rate

3. VFK1263 Counter Cables

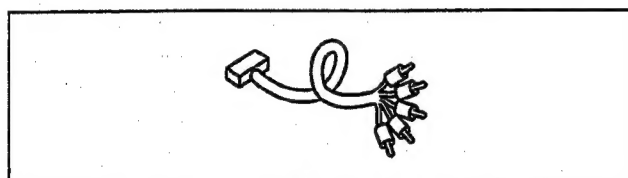


Fig. A2 For connection of the BER Counter

4. VFM3010EDS Alignment Tape

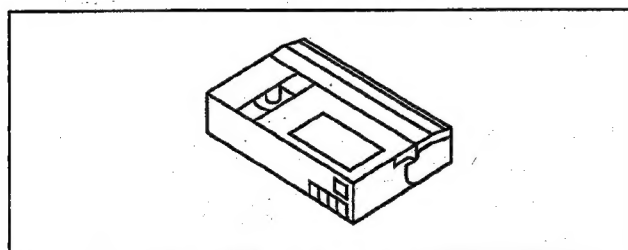


Fig. A3 For B.E.R. Adjustment

5. VFK1217 Sensor Cassette

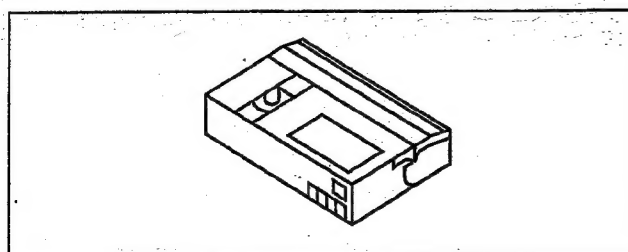


Fig. A4 For Sensor Adjustment

6. VFK1281 Mechanism Plate

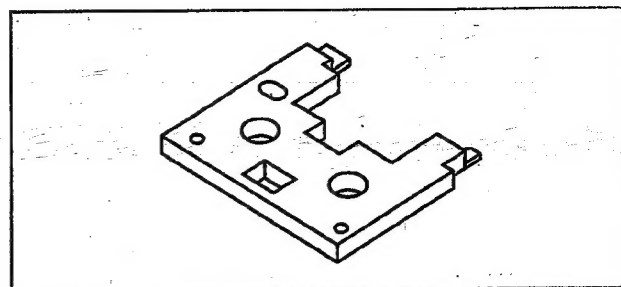


Fig. A5 For Post & Reel Height Adjustment

7. VFK1278 Post Adjustment Drive

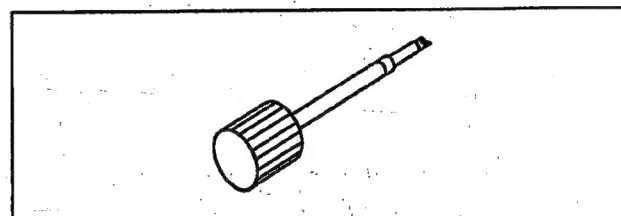


Fig. A6 For Post & Reel Height Adjustment

8. VFK1279 Cap. Tilt Adj. Plate

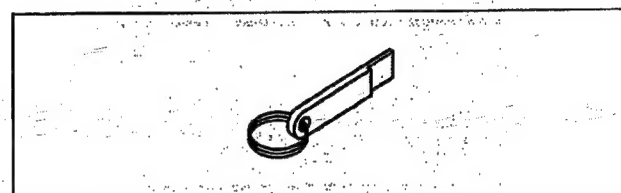


Fig. A7 For Capstan Tilt Adjustment

9. VFK1276 Loading Gear Driver

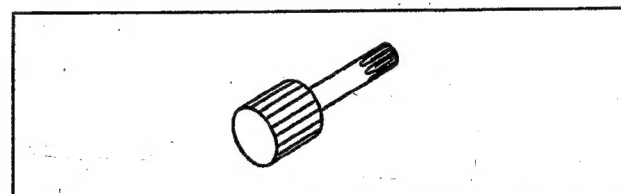


Fig. A8 For manual loading/unloading

### 3-2. Mechanism Adjustment

When the following parts is replaced, the mechanical adjustment is required.

Tension Post  
T3 Post  
Pad Arm Unit  
Supply or Take-up Reel Tables  
Capstan Motor

#### <PREPARATION>

Remove the Garage Unit and Loading Motor Unit as shown in Fig. M1 to M5.

#### 1. Tension Post & T3 Post Height Adjustment

1. Set the Mechanism Plate (VFK1281) on the Mechanism Chassis.

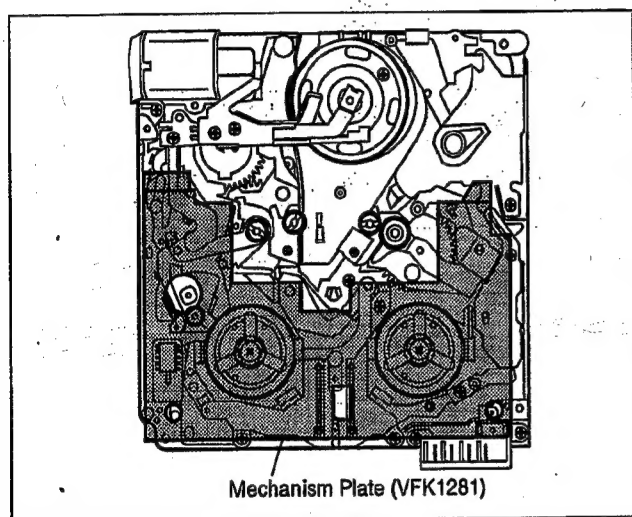


Fig. A9

2. Turn the Mode Gear fully counterclockwise to make full loading condition by using Loading Gear Driver (VFK1276).

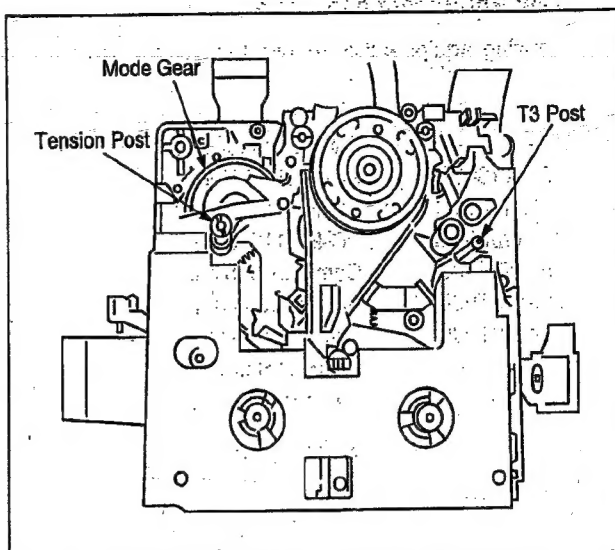


Fig. A10

3. Adjust the Tension Post so that the lower flange (A) point become same height level to the top surface (B) of 2nd step of the Mechanism Plate as shown in Fig. A11.

4. Adjust the T3 Post so that the lower flange (C) point become same height level to the top surface (D) of the Mechanism Plate as shown in Fig. A11.

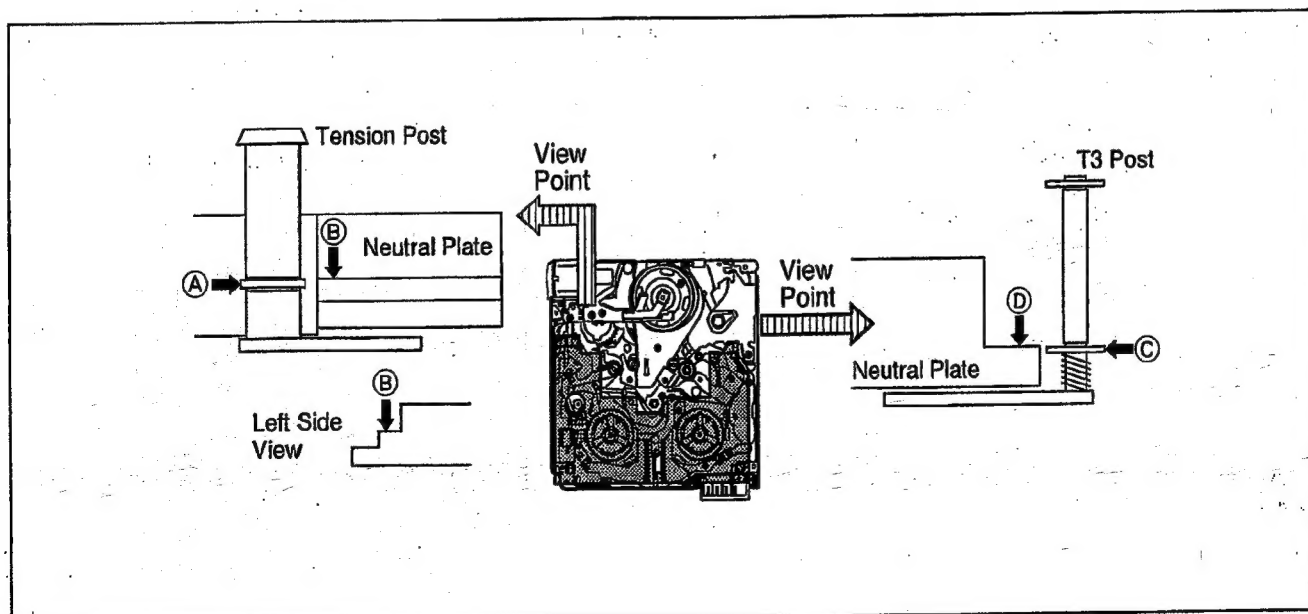


Fig. A11

## 2. Tension Post Position Adjustment

1. Turn the adjustment piece on the Pad Arm Unit to fully counterclockwise.
2. Turn the Mode Gear to set the Mechanism position in the Play mode, the Soft Brake of the Pad Arm Unit just touch to the Supply Reel Table as shown in Fig. A12.
3. Set the Mechanism Plate on the Mechanism Chassis as shown in Fig. A9.
4. Adjust the adjustment piece on the Pad Arm Unit to clockwise direction slowly until the surface of the Tension Post comes to 2nd step (F) on the Mechanism Plate as shown in Fig. A12.

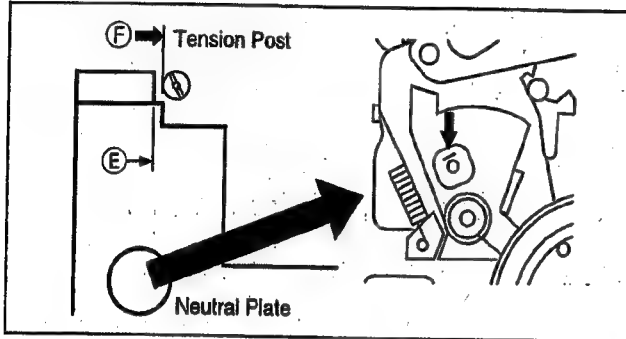


Fig. A12

5. After adjustment, turn the Mode Gear to unloading direction then turn back to loading direction, and make sure that position is correctly stop at above specification in Play position.

## 3. Supply & Take-up Reel Tables Height Adjustment

This adjustment should be perform for Supply or Take-up Reel Table one by one.

1. Turn the adjustment screw (A) on top of the Supply or Take-up Reel Table fully clockwise. Then, place the Mechanism Plate on the Mechanism Chassis as shown in Fig. A9.
2. Hold the Mechanism Plate by finger and slowly turn the adjustment screw to counterclockwise until just Reel Table rotating with adjustment screw as shown in Fig. A13.
3. Remove the Mechanism Plate and hold the Reel Table by finger then turn the adjustment screw counterclockwise to 45 degrees from above step point.

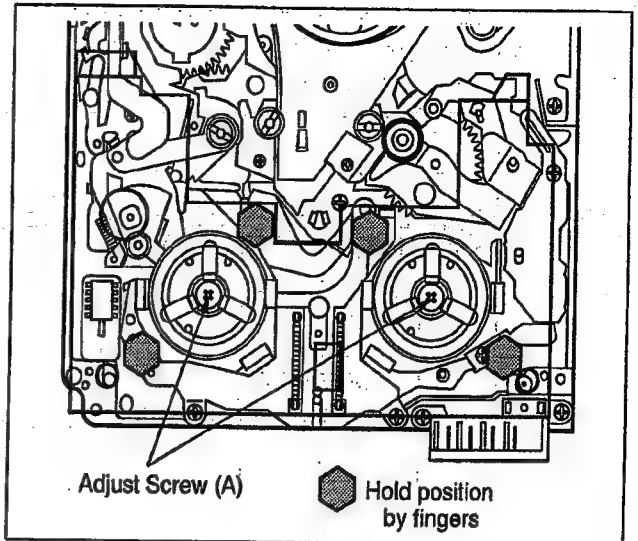


Fig. A13

## 4. Cap. Tilt Adjustment

1. Loosen the adjustment screw (G) and set the Cap. Tilt Adj. Plate (VFK1279) between Capstan Motor and Mechanism Chassis.
2. Turn the adjustment screw (G) to clockwise direction slowly until the Capstan Motor just touch to the Cap. Tilt Adj. Plate as shown in Fig. A14.

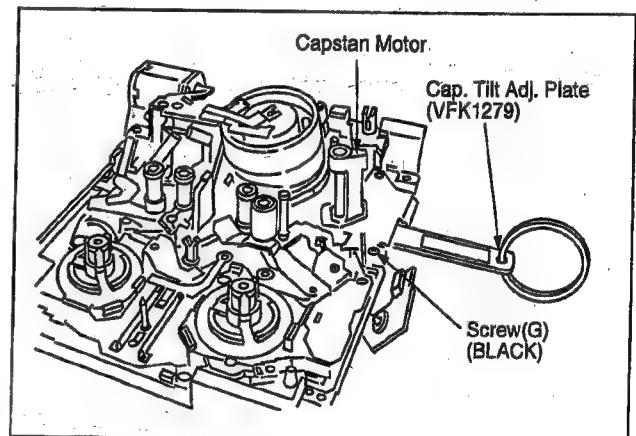


Fig. A14

## 5. Confirmation

### 5-1. Confirmation of tape travel

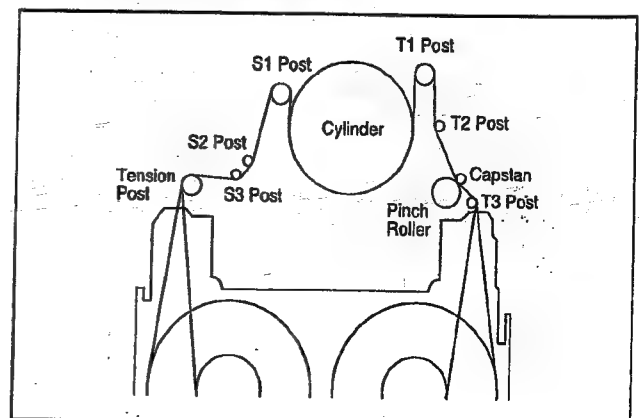


Fig. A15

Play back the cassette tape and confirm that the tape travels without curling at the upper and lower guides on the following posts in the Play and REV modes as shown in Fig. A17:



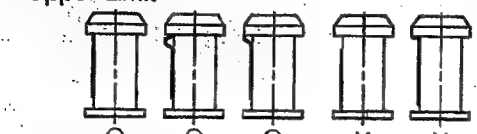
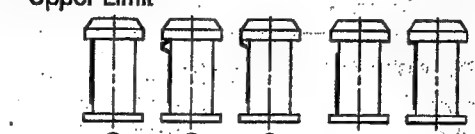
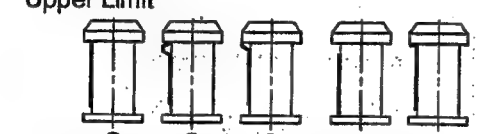

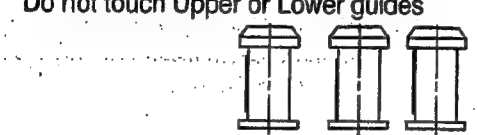
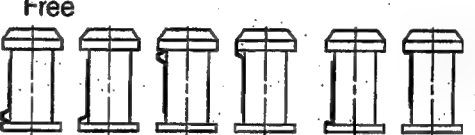
	PLAY	REV
Tension	Free 	Free 
S1	Upper Limit 	Upper Limit 
T1	Upper Limit 	Free 
T3	Do not touch Upper or Lower guides 	Free 

Fig. A16

If there are curing or damage at the guide of posts, readjust the height of the posts by turning the post with the Post Adjustment Driver.

## 5-2. Confirmation of the Envelope Output

1. Connect the "Tatsujin Kit" for video section as shown follows and play back a self recorded colour bar tape.

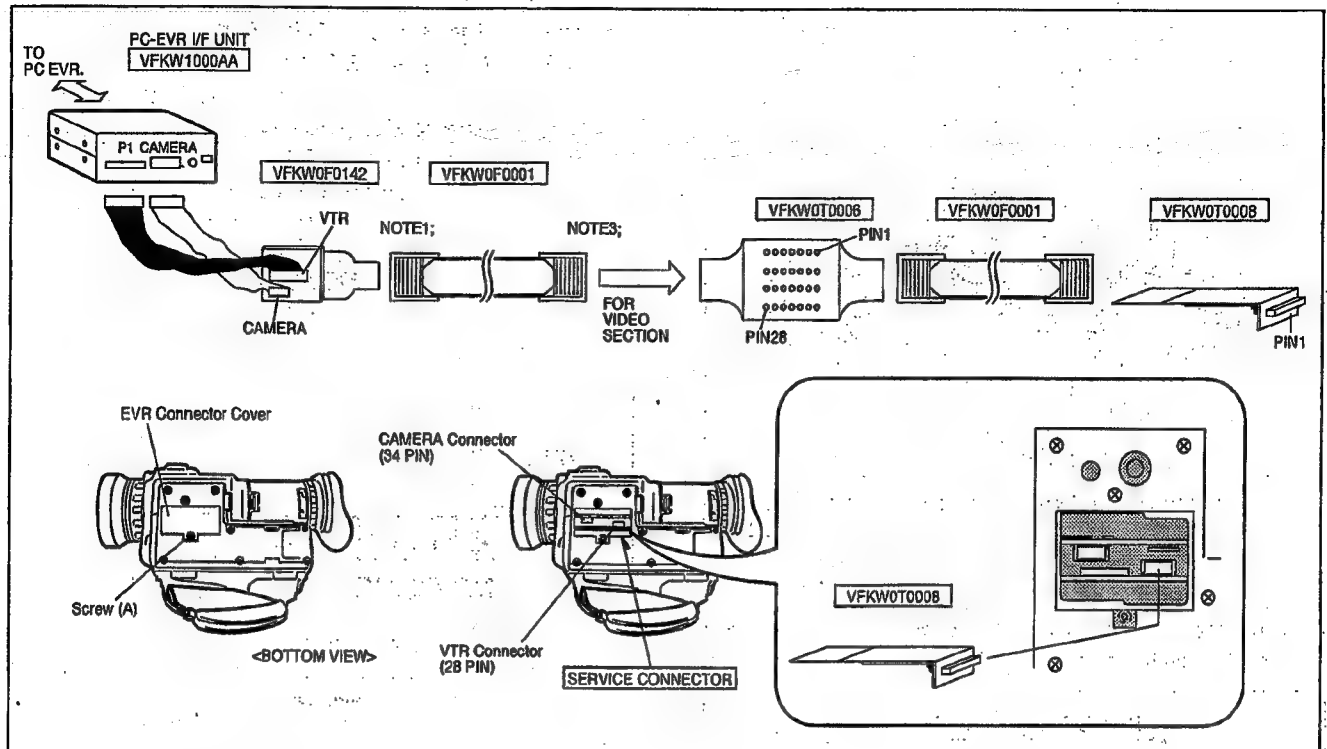


Fig. A17

2. Connect the oscilloscope to VTP1: (Envelope) and VTP2: (GND) on the SUB I/F Board (VFKW0T0006) and confirm that the envelope output is within following specification. Use VTP14 (HID) as a trigger.

V1/V max. 0.9  
V2/V max. 0.9  
V3/V max. 0.9

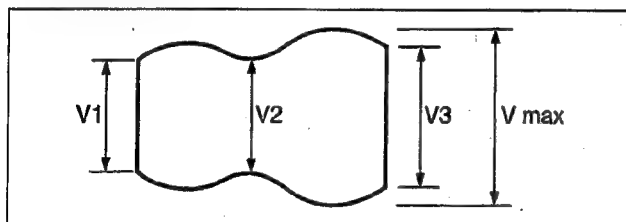


Fig. A18

3. If the level of the envelope signal is out of specification, readjust the Tension Post & T3 Post Height Adjustment.

<When adjusting the envelope signal within unit.>

1. Open the Cassette Door.
2. Unscrew screw (H) and release the Cassette Door Arm.

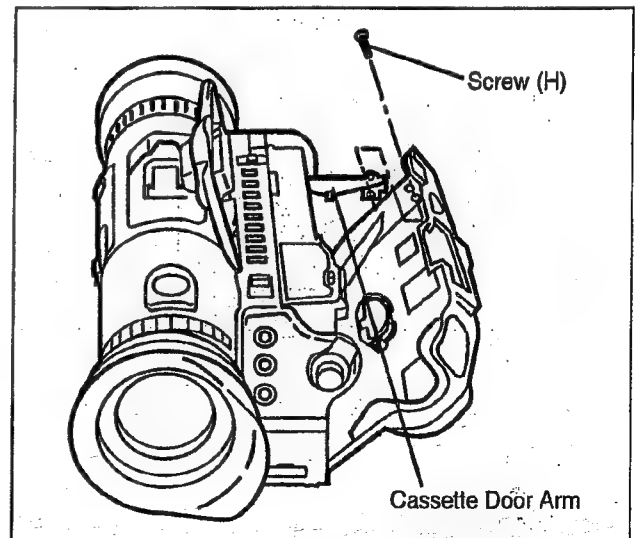


Fig. A19



3. Unscrew 2 screws (I) and remove the Cassette Cover Open/Close Detect Switch C.B.A. to inhibit the detection of the cassette door open.

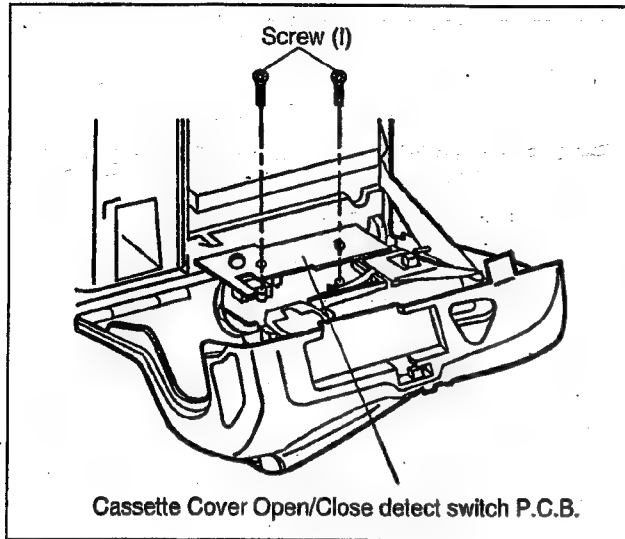


Fig. A20

4. Adjust the envelope signal by connecting the oscilloscope with "Tatsujin Kit" as shown in Fig. A17.

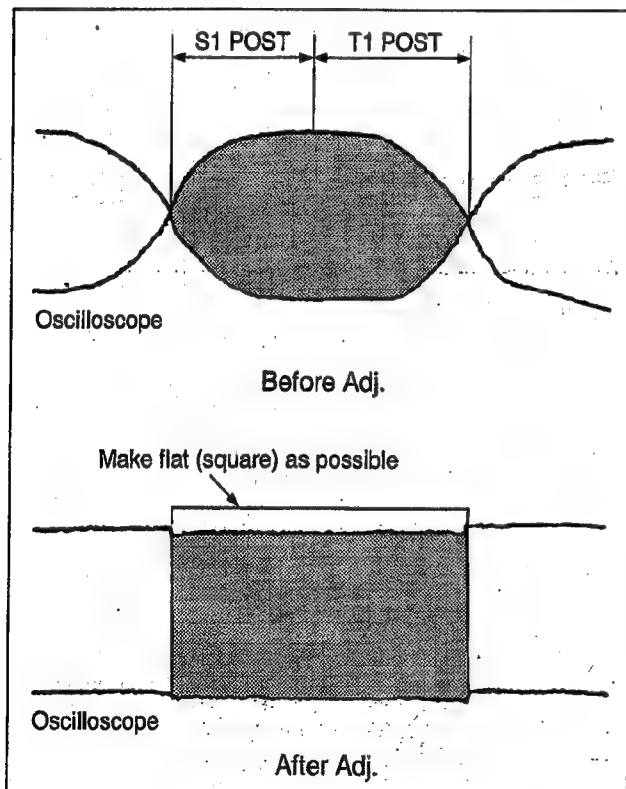


Fig. A21

6. Final Adjustment with BER Counter and "Tatsujin Kit".

#### RF Adjustment

Tp : VTP23 (SBE)

Mode : PLAY

Tape : Alignment Tape (Colour Bar)

M.Eq. : Oscilloscope, B.E.R. Counter

Spec. : B.E.R. counter number less than 200 on removed Mechanism unit.

Confirm that the B.E.R. counter number less than 50 in the fully assembled condition.

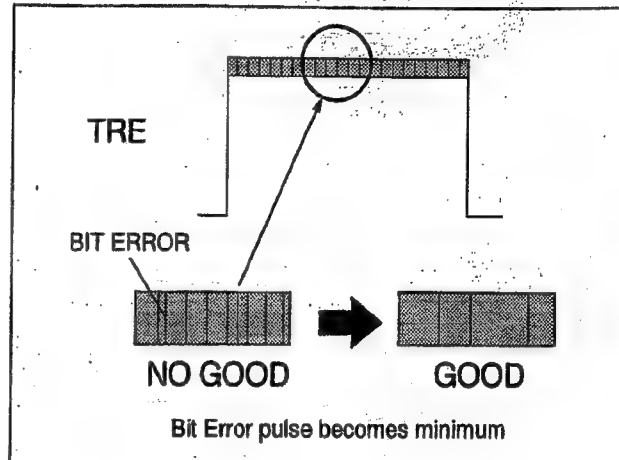


Fig. A22

### <Preparation>

Supply DC power supply (6V to 12V) to B.E.R. (Bit Error Rate) Counter.

Connect B.E.R. Counter (VFK1234) with B.E.R. Counter Cable (VFK1263) to following TP on PC-EVR I/F Board.

Sub I/F Board    BER Counter

Pin 9 [D. GND] ⇒ Black Clip

Pin 22 [CLK18] ⇒ Blue Clip

Pin 23 [SBE] ⇒ White Clip

Pin 24 [HID] ⇒ Red Clip

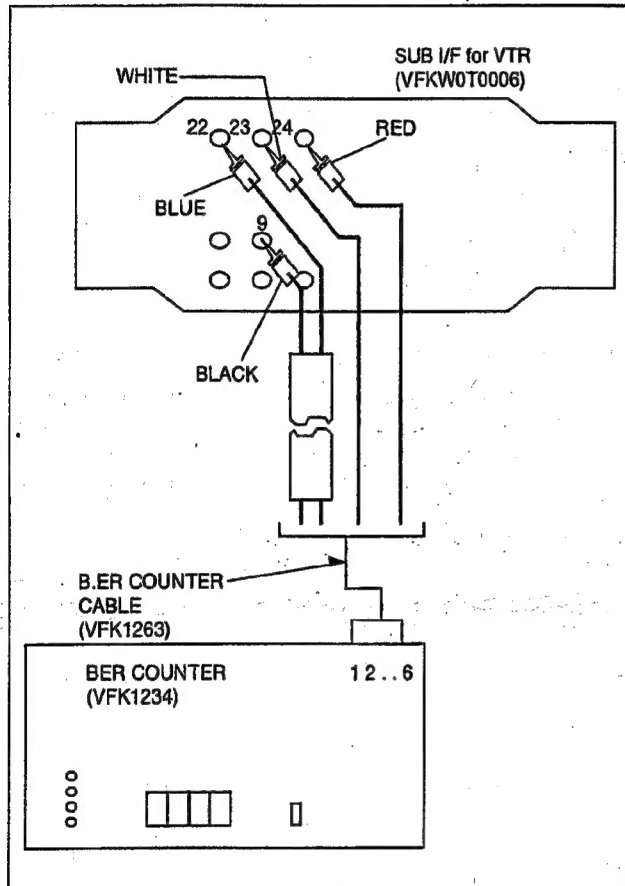


Fig. A23

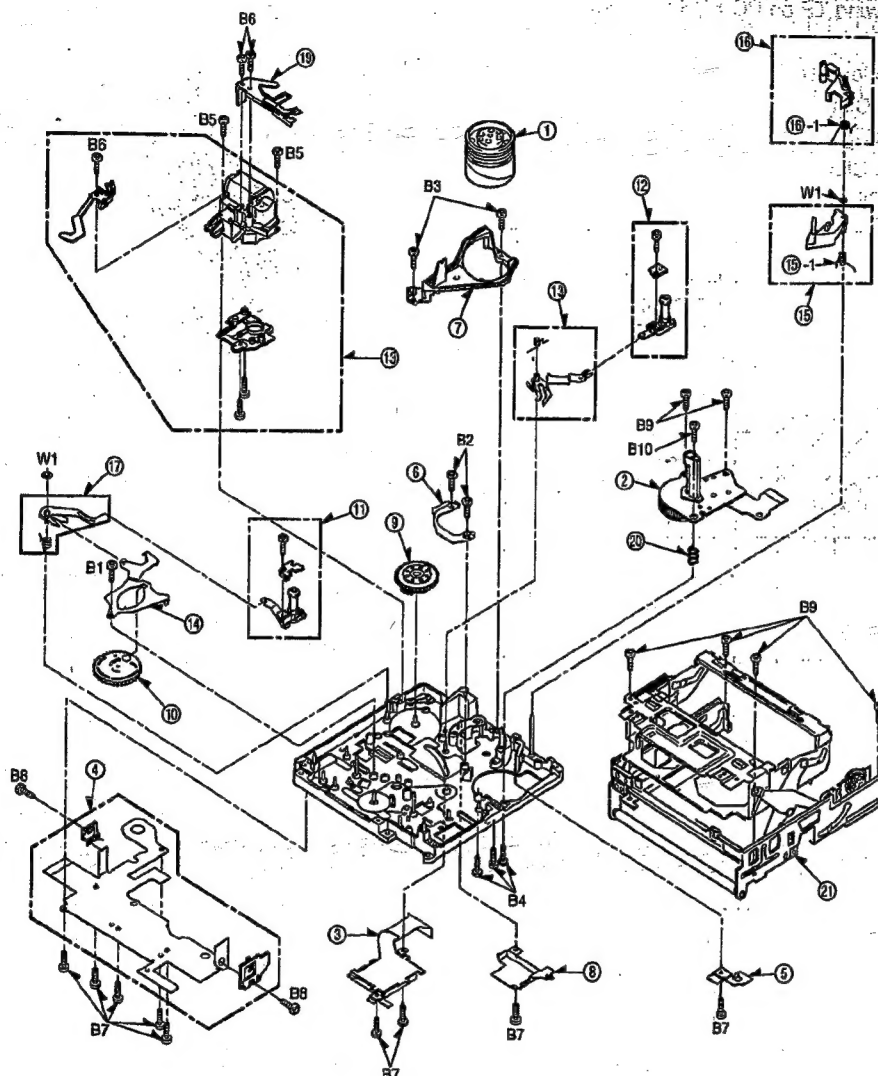
Confirm Bit Error Rate count becomes less than 50 in the assembly condition or less than 200 in the disassembly (Mechanism) condition for each head with B.E.R. Counter.

If not, repeat 5 point adjustments (DL, ERR DL, COMP LEV, CLK PHASE, ALPHA) again.

When the Sync Error happen, Bit Error Rate becomes less than 50 or 200. However, since this is not correct, please re-adjust it.


#### 4. Exploded Views & Parts List

##### ① VCR Mechanism 1 Section



Note: 1. \*Be sure to make your orders of replacement parts according to this list.

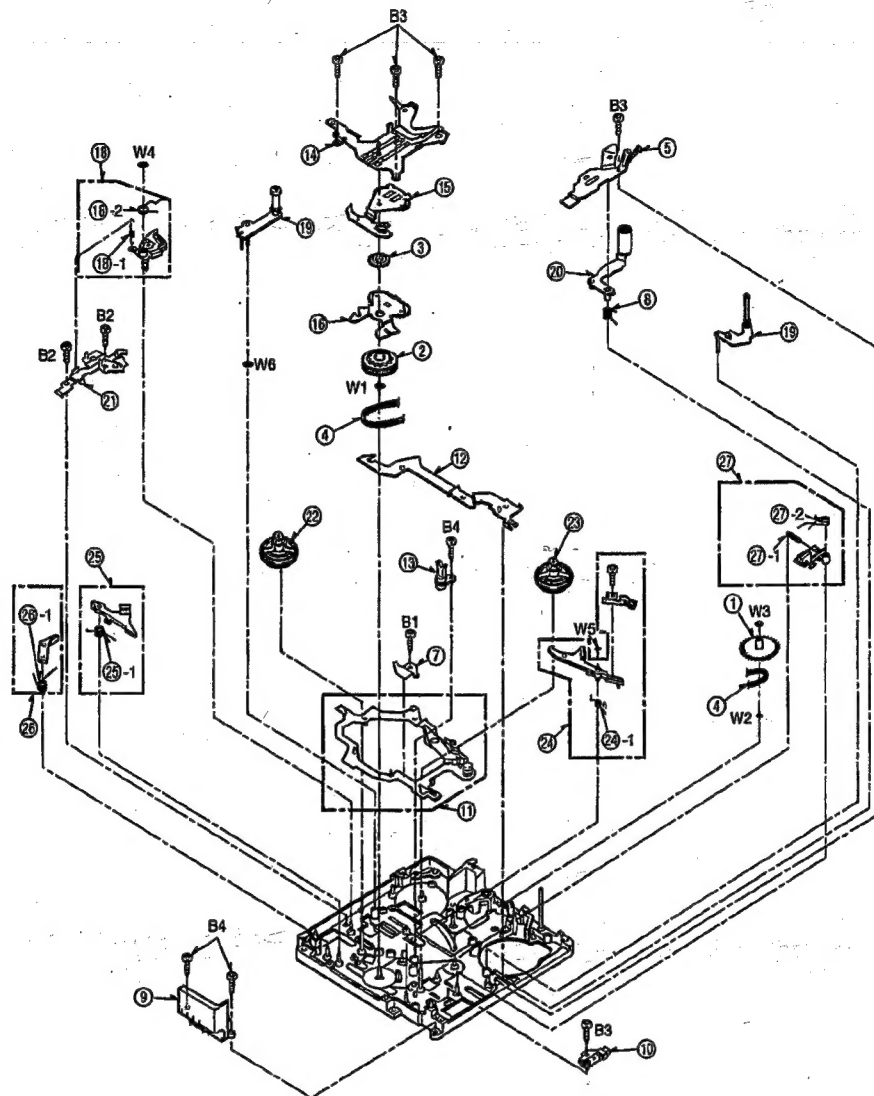
##### 2. IMPORTANT SAFETY NOTICE

Components identified with the mark  have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1	(1) VEG1217	CYLINDER UNIT	1	For NV-DX1
1	(1) VEG1438	CYLINDER UNIT	1	For NV-DS1, DS5
2	(1) VEM0624	CAPSTAN MOTOR UNIT	1	
3	(1) VEP05224A	HEAD AMP C.B.A.	1	For NV-DX1
3	(1) VEP05352A	HEAD AMP C.B.A.	1	For NV-DS1, DS5
3-*	(1) VSC4214	HEAD AMP SHIELD CASE	1	For NV-DX1
3-*	(1) VSC4639	HEAD AMP SHIELD CASE	1	For NV-DS1, DS5
4	(1) VES0711	FLEXIBLE CABLE	1	For NV-DX1
4	(1) VES0856	FLEXIBLE CABLE	1	For NV-DS1, DS5
5	(1) VMA9176	CAPSTAN COVER	1	For NV-DX1
5	(1) VMA9708	CAPSTAN COVER	1	For NV-DS1, DS5
6	(1) VMA9179	RADON PLATE	1	
7	(1) VMD2373	RAIL	1	
8	(1) VSC4215	SHIELD CASE	1	For NV-DX1
8	(1) VSC4640	SHIELD CASE	1	For NV-DS1, DS5
9	(1) VSR0114	MODE SW	1	
10	(1) VXA5407	CAM GEAR	1	
11	(1) VXA5409	S BOAT UNIT	1	
12	(1) VXA5410	T BOAT UNIT	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
13	(1) VXA5417	GEAR BOX (LOADING MOTOR)	1	
14	(1) VXA5612	RADON COVER UNIT	1	
15	(1) VXL2461	T2 ARM UNIT	1	
15-1	(1) VMB2789	T2 ARM SPRING	1	
16	(1) VXL2468	CLEANING ARM UNIT	1	
16-1	(1) VMB2791	CLEANING ARM SPRING	1	
17	(1) VXL2470	S1 ARM UNIT	1	
18	(1) VXL2471	T1 ARM UNIT	1	
19	(1) VMA9753	BRUSH ARM STOPPER	1	
20	(1) VMB2777	CAPSTAN ADJ. SPRING	1	
21	(1) VXA5387	GARAGE UNIT	1	
B1	(1) VHD0678	SCREW	1	
B2	(1) VHD0989	SCREW	2	
B3	(1) XQN14+B4	SCREW	2	
B4	(1) VXQ0439	SCREW	3	
B5	(1) XQN14+B35	SCREW	2	
B6	(1) XQN14+BQ4	SCREW	1	
B7	(1) XQN14+B15	SCREW	9	
B8	(1) XQN14+B2	SCREW	2	
B9	(1) VHD0882	SCREW	6	
B10	(1) XQN14+B4FZ	SCREW	1	
W51	(1) VMX2027	WASHER	2	

## ② VCR Mechanism 2 Section



Note: 1. \*Be sure to make your orders of replacement parts according to this list.

### 2. IMPORTANT SAFETY NOTICE

Components identified with the mark  $\Delta$  have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
1	(2) VDG1030	DRIVE PULLEY	1	
2	(2) VDG1031	CENTER PULLEY	1	
3	(2) VDG1032	CENTER GEAR	1	
4	(2) VDV0265	TIMING BELT	1	
5	(2) VMA9178	PINCH PRESSURE PLATE	1	
7	(2) VMA9181	BRAKE ROD SUPPORT (T)	1	
8	(2) VMB2776	SPRING	1	
9	(2) VSH0067	MIC SWITCH	1	
10	(2) VSJ0114	SOLENOID	1	
11	(2) VXA5401	BRAKE ROD UNIT	1	
12	(2) VXA5408	T3 ROD UNIT	1	
13	(2) VXA5411	LED HOLDER UNIT	1	
14	(2) VXA5412	COVER PLATE UNIT	1	
15	(2) VXL2454	P IDLER ARM UNIT	1	
16	(2) VXL2455	FR IDLER ARM UNIT	1	
17	(2) VXL2456	TENSION ARM UNIT	1	
18	(2) VXL2732	PAD ARM UNIT	1	
18-1	(2) VMB2788	TENSION SPRING	1	
18-2	(2) VMB2787	PAD ARM SPRING	1	
19	(2) VXL2462	T3 ARM UNIT	1	
20	(2) VXL2464	PINCH ARM UNIT	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
21	(2) VXL2466	EJECT ARM UNIT	1	
22	(2) VXR0347	SUPPLY REEL TABLE	1	
23	(2) VXR0348	TAKE UP REEL TABLE	1	
24	(2) VXZ0319	TAKE UP MAIN BRAKE	1	
24-1	(2) VMB2782	T MAIN BRAKE SPRING	1	
25	(2) VXZ0321	SUPPLY MAIN BRAKE	1	
25-1	(2) VMB2783	S MAIN BRAKE SPRING	1	
26	(2) VXZ0322	FF BRAKE UNIT	1	
26-1	(2) VMB2784	FF BRAKE SPRING	1	
27	(2) VXZ0323	REV BRAKE UNIT	1	
27-1	(2) VMB2786	REV SPRING	1	
27-2	(2) VMB2785	REV BRAKE SPRING	1	
B1	(2) VHD0882	SCREW	1	
B2	(2) XQN14+B15	SCREW	2	
B3	(2) VHD0883	SCREW	5	
B4	(2) XQN14+B35	SCREW	3	
W1	(2) VMX2503	WASHER	1	
W2	(2) VMX2400	WASHER	1	
W3	(2) VMX2504	WASHER	1	
W4	(2) VMX2027	WASHER	3	
W5	(2) VMX2028	WASHER	1	
W6	(2) VMX2394	WASHER	1	

# Memo

1. 1/11/1941

1. 1/11/1941

1. 1/11/1941